## Art. III. *On the Anatomical Characters of Asiatic Cholera, with Remarks on the Structure of the Mucous Coat of the Alimentary Canal.* By W. E. Horner, M. D. Professor of Anatomy in the University of Pennsylvania.

ASIATIC Cholera, as a subject of periodical literature, has had its various topics so extensively discussed by the most cultivated minds of this and other countries, that it is extremely difficult to add any thing new to the description of its phenomena, or to communicate any other results concerning it, than such as are similar to those already well known; though, it must be admitted, that much remains to be learned. Medical *speculation* also has been so actively employed in *conjecturing* its central point, and determining the manner in which its irradiations bring all other parts of the system within its influence, that mere powers of invention or fancy are almost as much at a stand as those of positive observation. Under these circumstances it is evidently expedient to undertake a purifying process, and in expelling from the account of the disease every thing depending upon mere fancy and false observation, to narrow its limits within the confines of well ascertained facts. The diligence with which it has been studied by pathologists, here and in Europe, has certainly contributed largely to determine the question of its throne being in the alimentary canal; and the next process is to ascertain which of all the alleged anatomical lesions there, are the specific ones, and to detect others, if such there be, as yet unknown.

With the view of explaining the extent to which my personal observations of the disease have gone, I may remark, that when it prevailed in Philadelphia, in August, 1832, one of the municipal Hospitals, provided for the occasion, and situated in Dock street, was placed under my charge; at the same period I was passing through a tour of service at the Alms-house, in Spruce street, above Tenth, in the capacity of prescribing physician, where the disease assailed at least one-third of its inmates, amounting at the time to about five hundred, to which number they were reduced by dismissals and removals; my private business of the period also brought me in contact with several cases. The experience derived from the above opportunities was augmented during the months of September and October, 1834, by a partial renewal of cholera, in the ranks of private practice, and among the inmates of the Alms-house, transferred in toto to the new building in Blockley township, on the west side of the Schuylkill. The whole number of cases which, at various times, have fallen under my attendance is considerably above two hundred, including hospital and private practice. This exposition is given simply with the desire to define the ground-work of the ensuing observations, and may answer instead of the more imposing and euphonical claim of "ample experience" occasionally resorted to, when an indication of place and time might be productive of some inconvenience to the writer.

The object of this paper being almost exclusively pathological, I have, with a solitary exception, omitted to mention cases of recovery after treatment, as I have nothing new to state in regard to the latter. The general result of my experience is, that the prodromes are with considerable certainty arrested by abstinence and rest, with very mild astringents—that the first period of the developed stage may be cured by bleeding and irritants to the surface, in a great number of cases, especially if the irritation already existing in the alimentary canal be not increased by drastic articles; and that the stage of acmé is next in certainty of result to a death warrant, the persons who escape from it being more indebted to a strong principle of life, than to any medication as yet devised.

With these preliminary remarks, I proceed to state, that the object of the present paper is to prove that in Asiatic cholera the following morbid anatomical characters are found in the alimentary canal:—

*First.*—A copious vesicular eruption, entirely distinct from the tumefaction of villi, muciparous follicles or glands, and which pervades the whole canal.

*Second.*—A lining membrane of coagulated lymph, which exists in the small intestines at least, if not in the stomach and colon also, and resembles in texture and mode of adhesion the membrane of croup.

*Third.*—Vascular derangements and phenomena which are confined almost exclusively, if not entirely so, to the venous system.

*Fourth.*—An exfoliation of the epidermic and venous lining of the alimentary canal, whereby the extremities of the venous system are denuded, and left patulous.

The singularity of some of these positions, especially the third and the fourth, the former of which invades the universal doctrine of arterial action in morbid derangements, and the latter assumes a ground* as yet contested, and even generally reprobated by anatomists and by myself also until lately, calls for an exposition of the structure of the mucous coat of the alimentary canal, according with my personal observations of it.

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* The existence of epidermis.

I have always felt an extreme interest in obtaining a knowledge of the pathological changes in cholera; for the very evident disproportion, between the intense symptoms of the disease and the trivial appearances reported from thousands of dissections, exhibits an hiatus to the anatomist, well calculated to make him review all his knowledge of the natural structure, and to test its accuracy. The first appearance of cholera here, being in 1832, was attended with so much confusion, and such an uninterrupted demand upon time, that I found it impossible to study it anatomically to any extent and with much advantage; it was, in fact, an opportunity almost lost. Its recurrence last year presented cases so few in number, and with such intervals of date, that after making the recent dissections, I proceeded generally to more detailed and protracted observations by drying parts—steeping them in spirits of wine—injecting and other modes of preparation; and having in that way obtained my morbid standards, tried counter observations on natural structure.

The mucous coat of the alimentary canal, in a healthy state, and successfully injected, appears to consist almost entirely of a cribriform intertexture of veins; these veins being commonly empty at death present themselves as a soft spongy structure, which gives rise to the ordinary description of its sensible condition as a velvety layer. The most minute injection of the arteries scarcely makes itself visible among these veins when they are properly injected, a straggling branch only here and there exhibiting itself. The arborescence of the arteries is confined to the level beneath the venous intertexture, and is there developed to an extreme degree of minuteness, being intermixed with corresponding venous ramuscles, generally larger and more numerous than the arteries themselves. The fine venous trunks of this deeper layer have their originating extremities bent vertically towards the cavity of the gut, and by that means receive the blood of the first venous intertexture or layer, as the petrous sinuses join the cavernous, or the veins of the penis arise from its spongy structure. The meshes of the first venous intertexture are exceedingly minute, and vary in a characteristic manner in the stomach, small intestines and colon. This intertexture is very different in its looks from a common vascular anastomosis, and produces in the colon an appearance resembling a plate of metal pierced with round holes closely bordering upon each other; these holes constitute in fact follicles or gaping orifices, the edges of which are rounded off, and their depth is that of the thickness of the venous anastomosis being bounded below by the arterial venous layer, and by the cellular coat of the part. Nothing short of an entirely successful injection will exhibit this venous anastomosis as described; and it may be seen either by injecting a vein, or an artery provided the injection passes from the artery into the veins, but the latter process is the least desirable, because we lose the benefit of a distinction of colour between the two sets of vessels.

As this *superficial venous layer* performs an important part in the pathology of cholera, I shall introduce the name here given, as a term to express that lamina of the mucous coat, and beg the reader's attention to it as now defined.

Ordinary modes of examination give no evidence of the existence in the alimentary canal, from the cardiac orifice of the stomach to near the anus, of an epidermis; on the contrary, they rather lead to a belief of its being absent, in consequence of the softness, tenuity, and transparency of the mucous membrane; but that it is really present, may be proved by the following process:—Tear off the peritoneal coat—invert the part and inflate it to an emphysematous condition; the epidermis will then be raised as a very thin pellicle, and may be dried in that state; but as this pellicle retains the air, we hence infer that it lines the follicles, and is uninterrupted by any perforations. This epidermis, if the part be previously injected perfectly, shows dots of injecting matter, but no arborescence if it be inflated up from the veins. In so doing the villi disappear, are in fact unfolded.

The villi cannot be seen to any advantage except they be erected by an injection, in which case those of the upper part of the small intestines are found to run into each other very much like the convolutions of the cerebrum, and to press upon each other's sides in the same way. Some of them, however, are merely semi-oval plates, the transverse diameter of which exceeds the length. At the lower end of the small intestine they become simply conical projections, somewhat curved, with the edges bent in, and they retain this mechanism until they entirely disappear near the ileo-cœcal valve. In the whole length of intestine there is, however, every variety of shape, from oblong curved and serpentine ridges, to the flattened cone standing on its base; the first condition changing gradually to the last in the descent of the bowel. Conformably to this definition of villi, none exist either in the stomach or colon, for there we have only the venous mesh. The villi of the jejunum are about the thirtieth of an inch high, and those of the ileum about one-sixtieth.

The superficial venous layer has great regularity in the ileum, and the conical villi stand out beautifully from its partitions, or, in equivalent language, from the divisions of the follicles. In the upper part of the small intestine the follicles are in equal number to what they are in the ileum; the regularity of their arrangement being interrupted by the long serpentine and oval villi; but invariably the same venous intertexture exists and forms in both, the chief bulk of the villi by passing into them.

In the stomach the *follicles* vary much in size, and there is an arrangement whereby many of the smaller ones are seen to open into the larger; on an average about two hundred and twenty-five are found upon every eighth of an inch square, which would give of course to an inch square sixty-four times that amount, or fourteen thousand four hundred follicles, and conceding the whole stomach to present an area of ninety inches, which is probably below the mark when this organ is moderately distened, as exhibited in the preparation upon which this calculation is founded, the entire number of follicles is *one million two hundred and ninety-six thousand.*

The greater uniformity of size of these follicles in the colon, and its even surface, enable us to count them with more certainty, and they appear to exist at the beginning of this gut at the rate of about four hundred for every eighth of an inch square, and in the sigmoid flexure at the rate of about two hundred to the same area; they become, in fact, both smaller and less numerous in descending towards the anus. Admitting the entire area of the colon to be five hundred inches, and nineteen thousand two hundred of these follicles, on an average, to exist on every inch square, the aggregate number will be *nine millions six hundred thousand.*

Again, estimating the whole area of the mucous coat of the small intestines at fourteen hundred and forty inches, and allowing for interruptions occasioned by villi, about twenty-five thousand follicles are found upon every square inch, and the two numbers multiplied, produce *thirty-six millions.*

The entire number of follicles in the whole alimentary canal is, by the preceding estimates, forty-six millions, eight hundred and ninety-six thousand. I am very far from pretending to have counted them all, but have made an approximation to the actual number by observing sections of different portions of the same subject, and verifying the observations upon other subjects. The external surface of the cutis vera presents, as it were, in outline the same arrangement; the venous reticular intertexture appearing broader, not quite so perfect, and more shallow, and forming the papillæ; but as additional experiments are wanting it, it may be passed over with this transient notice; perhaps, indeed, a more skilful hand in adopting the hint may perfect the details.

In the stomach, the largest of these follicles is about $\frac{1}{98}$th of an inch in diameter, and the smallest about $\frac{1}{490}$th. In the colon the largest is about $\frac{1}{245}$th of an inch in diameter, and the smallest about $\frac{1}{490}$th. In the small intestines their size varies in about the same ratio as in the colon, but they are much more irregular in shape, being scattered more in groups in consequence of the villi intervening; some of them penetrate obliquely towards the foundations of the villi, hence when examined from the exterior, their distribution is more regular, and they are seen lodged in the cellular coat of the gut.

I have endeavoured to keep the estimate of the number of follicles below what other calculators would make it upon an observation of my preparations, and a fair measurement of the area of the alimentary canal, lest the number may seem excessive and incredible; I have therefore the most reasonable assurance of being within bounds on that point. I may now ask their use; is it to secrete or absorb? If they are simply secernents of mucus, the number, one would think, much greater than so limited a secretion requires—morever, why is it that they become smaller and less numerous towards the lower end of the large intestine, where greater lubrication is required for hardened fæces; in addition, are not the glands of Brunner, (solitariæ,) and of Peyer, (agminatæ,) amply sufficient to furnish the required mucus? Again, after most sedulous observations upon the villi of all kinds, finely erected by my injections, and placed under most accurate, simple, and compound microscopes, I find invariably a polished reflecting surface, uninterrupted by foramina, either at their ends or sides, while many of these follicles are found passing obliquely into their bases. An excellent Woollaston's doublet, which makes the villi of the ileum appear an inch long, exhibits them with a polished translucent surface, without foramina, except where a villus from accident has been broken, a contingency readily recognised by one in the habit of viewing them. Finally, if the lacteal foramina of Lieberkuhn and others, do exist in fact, why is it that the raising of the intestinal epidermis by inflation does not exhibit these foramina by the air escaping through them, but on the contrary, admits of a dried preparation in that state, the villi being completely effaced.

In these and other microscopical observations, I have been much assisted by my young friend, Dr. PAUL BECK GODDARD, who has acquired an accuracy and skill in such matters deserving of confidence.

Taking into consideration these several objections to the theory of the follicles being secreting orifices, it appears to me that a better idea of their use is called for, which suggestion is submitted to the profession, with the hope that a more capable person will remove the difficulty by additional confirmation of preceding theories, or by the invention of a new one; for my own part, I am much inclined to adopt the opinion of their absorbing faculties. It is generally conceded that the erection and prehension of the Fallopian tube is produced by a vascular turgescence, in which the veins, from their number, must execute an important part; in like manner as these follicles are formed in the midst of veins, their orifices only become erect and patulous by the distention of those veins, and cannot be seen, especially in the small intestines, unless an injection has succeeded fully; but the erection of these veins during digestion puts the follicles in a similar condition; there is therefore some ground of inference, that the act of the Fallopian tube in conveying a germ, and of a follicle in conveying into the thickness of an intestine congenial matter, may be analogous.

Notwithstanding the facility with which I can detect these follicles, I have failed entirely under various means of examination, in finding any orifices to Peyer's glands, in the dried intestine; they appear to be merely small lenticular excavations in its substance, and wherever a cluster of them exists, it disturbs the arrangement of the villi, and gives to them a scattering unequal distribution. I would also suggest very respectfully to anatomists, whether our knowledge in regard to them is sufficiently exact to render further inquiry useless? for my own part it appears that this subject requires some additional attention.

An able exposition of the precursory indications of the epidemic and its statistics, for 1832, in regard to this city, having appeared from the pen of my colleague, Dr. SAMUEL JACKSON, (Vol. XI. p. 289, of this Journal;) the reader desiring information on those points is referred to it.

As cholera is exhibited under every gradation, from a mere shade of indisposition in the action of one or more functions, to the unequivocally moribund condition, I shall with the view to a methodical use of my own observations consider its stages to be those of incubation, maturity and acmé, preferring these denominations to such as express particular symptoms, for the reason that scarcely any single symptom is invariably found even in cases which in other respects present no obscurity. It is to be regretted that this or a similar classification is not universally adopted in reports of practice, as it would enable us to appreciate more exactly the value of treatment when the cases are not detailed. The first stage we know to yield in a vast majority of instances, to almost any kind of medication which is not highly perturbating, and it would perhaps yield, from its natural tendencies to a cure, with about as much certainty to a restricted regimen and a warm bed. The other stages require the interposition of art, and manifest the skill of the practitioner. It is, however, worthy of remark, that under every variety of practice, the general results in a large population vary but little, in exhibiting one death in every three reported cases. A fact which may well induce us to doubt whether any real progress has been made in perfecting the treatment of cholera, since its first appearance in India, in 1814.

The appearance of Asiatic cholera at the Alms-house, Blockley, in 1835, was ushered in by the following equivocal cases, exhibiting as subsequent events proved, the livery of this disease, but in characters so doubtful, as to leave us in much indecision in regard to their real nature at the precise date of their occurrence.

Copied from Drs. Skinner's and Porter's Book of Cases.

"Mary Kurtz, aged fifty years, admitted into women's medical ward upon the 15th of September, 1834, about 3 o'clock, P. M. Stature small and frame rounded. She had had diarrhœa for twenty-four hours previously to her admission. The countenance was of so peculiar a cast, that I pronounced upon the nature of the disease before questioning the other symptoms. Intellect sane; the lips, tongue, and extremities were cold; corrugation of the skin of the hands and feet; nails blue; voice broken; respiration embarrassed; thirst intense, eyes sunken, with an occasional spasm of their muscles, and turning the balls upwards; nausea, but no vomiting; she had the latter prior to her admission; the discharges from the bowels were not frequent or large; they were of a light pink colour, of a watery consistence, and smelled badly. During her expiring moments the whole muscular system was exceedingly convulsed.

The usual rubefacient measures were resorted to, but with no apparent good effects. Ice cold wine was given, but with no benefit. A vein was opened upon the back of the hand, but no blood flowed; then one in the arm was divided, and one ounce of blood was taken with difficulty; it was nearly black, and quickly coagulated, with no separation of its parts. About two hours before her death, which happened about 8 o'clock on the same day of admission, I gave her ʒj. of calomel.

An examination of the body was made eighteen hours after death by Dr. Horner, in the presence of the resident physicians.

Upon turning aside the muscles of the abdomen, the small intestines externally were found injected with blood to a light scarlet redness. Stomach was contracted, and contained a considerable quantity of mucus. The inner membrane had upon it several large patches, of a deep red injection, but was unaltered in its structure. Nearly the whole of the small intestine contained mucus, or mucus and blood, or mucus and pus. In the upper part the former abounded, and in the lower part towards the valve the reddish discharge was found. The mucous membrane nearly throughout its extent was injected to a bright red colour. On dividing the coats of the intestine, the sub-mucous tissue was found very deeply injected, with numerous vessels filled with blood. The colon was not so much injected, and contained a whitish fluid of the consistence of cream. Bladder slightly contracted, and contained urine. The gall-bladder contained bile of nearly a healthy colour. The calomel was found both in the stomach and colon; pancreas healthy. Dissection not carried further."

At the same time, Patrick Murphy, a black man, aged thirty, and under treatment for dysentery of some duration, was seized suddenly in the night with frequent and large evacuations of serum, sunk away and died before day. On examination in the afternoon, the mucous coat of the colon was found covered with red granulations, and small ulcers, as in other cases of somewhat protracted dysentery, but there were no particular traces of cholera.

Case I. *Philadelphia Alms-house, Blockley, September 23d, 1834—Asiatic or Malignant Cholera—Sudden death at night, without any one being aware of the illness.*—H. S. Mulda an inmate of some years, supposed age about seventy, a Norwegian by birth, appearance highly venerable from a long flowing white beard, which he took great pleasure in cultivating, but which was removed from him by force a short time before his death; stature five feet seven inches; habits extremely regular; demeanour quiet; mind unsound; remarkable for his taciturnity and for his reserve about his own history; went yesterday afternoon near sundown to a pile of fresh oyster-shells and was seen nibbling at them; he also may have got some oysters from them in an unsound state. His common usage having been to touch nothing but bread and water, as he was perfectly temperate, it is difficult to account for this whim about the oyster-shells. Nothing more was observed of him till this morning early, when he was found in bed dead, sitting against the wall at the head of his dormitory. His limbs were rigid; a chamber-pot was full of rice-coloured water, and some was found on the floor.

*Autopsy, at* 1 *o'clock, P. M.*—No putrefaction; a blueness at the ends of the fingers and toes. Peritoneum dry. Stomach contained a gruel-like fluid, of a light slate colour, and was universally variegated with spots of red inflammation in its mucous coat, which was softened. Small intestines: mucous coat of a light red colour, decreasing down to ileo-colic valve, and containing the sero-fibrinous fluid commonly called rice water; Peyer's glands very distinct. Having thrown a minute size injection into the vessels of the small intestines, and dried them, I found adhering to some of the valvulæ conniventes groups of small vesicles which did not seem to have reached that state of maturity exhibited in subsequent preparations of other subjects. This may have arisen from the suddenness of death after the invasion of the disease. A single vesicle like a marble on a board, and distant from the others, seemed to have reached the matured stage. Colon: mucous coat nearly white, with here and there a light pink tinge; its head and ascending part contained the same sero-fibrinous fluid; the remainder was generally contracted, with the exception of intervals affording a collection of the like fluid. Small sharp fragments of oyster-shells were found along the whole alimentary canal, so that if all had been collected it would have amounted to several tea-spoonfuls. The veins of the alimentary canal were all congested with blood. Bladder contracted. Rectum contracted. Liver, excepting effects of old age, healthy. Gall-bladder contained an ounce of mucus deeply tinged yellow with bile. Spleen sound. Lungs perfectly sound, as healthy as those of a calf, and no congestion in them; of the grayish tint peculiar to old age. Aorta perfectly sound, elastic like that of a child, of a brilliant white internally, showing the temperance of the man.

Case II. *Alms-house, Blockley, September* 24*th,* 1834—*Death in eight Hours from first Invasion—Mollescence of Mucous Coat of the Alimentary Canal,—Fibrinous Lining.*—John Thomas, aged fifty-three, naturally a robust man, but now reduced to a middle state of emaciation by a pectoral affection, has been in this house for a fortnight or so, in which time he has been treated for chronic catarrh, attended with large discharge of muco-purulent matter.

Being seized suddenly with the characteristic symptoms of cholera, which I may omit here, he went rapidly into the cyanose state and died at the end of eight hours.

*Autopsy.*—The stomach and bowels contained a great abundance of cholera, (sero-fibrinous,) fluid; that in the stomach was tinged yellow from regurgitated bile, and it exhibited the same colour in the duodenum and upper part of the jejunum from the same addition; but in the remaining portion of the intestines it was of the common semi-transparent appearance, becoming turbid on agitation, but subsiding clear in a short time.

The mucous coat of the stomach and bowels was so soft as to be torn off easily by scratching with the end of the nails. The whole alimentary canal had a macerated aspect, such as we see when it is found somewhat congested with blood and is afterwards soaked in water for a day or two. The small intestines were lined by a thin soft fibrinous layer or film, which was easily detached; a very faint pink colour perceptible in spots on the mucous coat of the stomach and bowels. Some remains of undigested fruit, thought to be cantelopes, were found in the alimentary canal; lower part of colon and the rectum much contracted; urinary bladder drawn up into a ball.

Case III. *Alms-house, Blockley, September 24th,* 1834—*Asiatic Cholera—Fibrinous Lining of Small Intestines.*—Jacob Myers, a black man, aged thirty-six years, of a make somewhat robust, and under treatment for a scrofulous tumour of the shoulder, died last night under well-marked symptoms of cholera, which terminated in eight hours from the first invasion of the affection.

*Autopsy.*—The mucous coat of the stomach and small intestines had a strong inflammatory tinge; the latter were filled with sero-fibrinous fluid, and were lined in almost their whole length by a layer of fibrine; this layer was about half a line in thickness, and adhered to the mucous coat as a layer of fresh fibrine does to the pleura or peritoneum; that is to say, with a degree of tenacity permitting it to be rubbed off with the finger or floated in water, so as to exhibit both its adhesion to the intestine and its distinction from it. Having taken a piece of intestine home and hardened it in alcohol, the layer of fibrine was made manifest beyond controversy, and required to be separated with the end of a scalpel, exhibiting in that way its course uninterruptedly over the valvulæ conniventes, and down in the depressions between them. The difference marked in the thickness of this membrane was, that it began as a film in the duodenum and increased insensibly to half a line at the lower end of the ileum. At the suggestion of Dr. Physick I took a piece of the intestine, which had been preserved in alcohol, and after a maceration of a week, in a room the temperature of which was seventy degrees of Fahrenheit, the membranous character of the lining was still preserved.

A similar membrane was not found adhering to the internal coat of the stomach and colon. The shade of the latter was several degrees less inflammatory than that of the stomach or small intestines. Peritoneum dry. Other abdominal viscera healthy. Gall-bladder filled with yellow mucus. Bladder contracted.

Case IV. *Alms-house, Blockley, September 25th,* 1835—*Asiatic Cholera—Fibrinous Lining of Small Intestines.*—Thomas Parker, a black man, aged twenty; previous disease an ulcer; habits intemperate; make muscular; symptoms well marked, and which continued twelve hours from their first invasion. He had taken Aq. camph. ℥i.; and Tinct opii, ʒi. occasionally repeated.

*Autopsy.*—We found in him the same sero-fibrinous fluid filling the alimentary canal; the same inflammatory tinge of the mucous membrane of the stomach and bowels, especially the small, and the same lining of the latter by a fibrinous membrane adhering to their walls, and coating them like the lining of fibrine to the trachea in croup. The small intestines flaccid but distended with the sero-fibrinous fluid, which, when it had rested in the loops of the intestines, was as clear as whey. The lower half of colon contracted and empty. Peritoneum dry. Gall-bladder contained ℥ij. of mucus tinged of a deep green by the bile. Urinary bladder contracted. Other abdominal viscera perfectly sound. Thorax sound. Muscles of the colour of the leg of a chicken just killed.

Two other patients died suddenly complaining of pain in the abdomen. One we knew to have a hypertrophy of the heart; on dissection it was found of double the natural size, and of a sort of leathery feel. The left ostium venosum was contracted to half an inch in diameter, and had vegetations on its valves. The orifice of the aorta was contracted to the same size, and its valves were also covered with the same sort of vegetation. This man had the usual attendants of such a heart, to wit, dropsy of pericardium ℥iij.; dropsy of each pleura Oij.; dropsy of peritoneum, and general anasarca. The bowels did not seem to have been moved, as the colon was occupied with consistent fæces. There was, in fact, no internal evidence of cholera. Bladder distended with urine.

The other, a black man, was also examined, who was admitted in the afternoon of the 24th, complaining of dysentery. I found no evidence of cholera in him; the small intestines and large were without fæces, but occupied by mucus tinged green with bile and entirely destitute of any thing like a sero-fibrinous fluid. He had taken Aq. camph. and laudanum, and the mucous coat of the stomach was reddened perhaps by them. His muscles were of a beef red colour, and all the organs of the abdomen, thorax, and the brain sound; the only thing wrong was air in some of the veins of the pia mater in the top of the right hemisphere and in the venæ galeni. As he had been dead about four hours only, there was no putrefaction; the inquiry therefore is, whether the development of gas in the blood vessels of the brain was the cause of his death?

Among the most remarkable of the phenomena of Asiatic cholera, is the extreme rapidity with which it carries off anasarcous effusions. Mr. GENDRIN, (Monographie du Cholera Morbus, p. 5,) mentions the great surprise he encountered from a patient of his hospital who had chronic pleurisy with ascites; where in one night the ascites disappeared under the influence of a serous diarrhoea, the man dying the next day with the symptoms of cholera. A strong illustration of this fact was presented in our own clinical observations, as follows:—

CASE V. *Alms-house, Blockley, September 28th,* 1834.—John Wellwood, aged thirty years, was admitted about a week ago for anasarca from his crown to his feet, and which had bloated him up to the size of a very fat man, obscuring completely the glans penis by the elongation of the prepuce, and making the scrotum the size of a quart measure. An attempt was made to remove this effusion by elaterium, but the article, even a dose of half a grain, disagreed with him so much that it produced convulsions, and was therefore abandoned. We next resorted to an infusion of horse-radish in cider, and while he was under the administration of it a copious serous diarrhœa ensued, which, in two or three days, removed the whole of the anasarca, and left him an extremely emaciated man. Within twenty-four hours of this date he had discharged, per anum principally, at least two gallons of serum. His pulse is now weak, his voice feeble, skin cold, and he has the strongest indications of going into the collapsed stage of cholera.

Wellwood died at 3 o'clock on the morning of the 29th, the diarrhœa having continued notwithstanding the administration of astringents, opiates, and other expedients to arrest it. At 11 o'clock, A. M. of the same day, I examined him in the presence of the house pupils and physicians.

His stomach and bowels contained to the amount of a pint and a half or two pints of a sero-fibrinous fluid, mixed up in a very pulpy state, such as we sometimes see in ascites. At intervals the fluid resembled more the rice-water discharges, which were collected in small quantities in separate loops, especially of the small intestine.

Externally the alimentary canal had the pink colour, with turgescence of the veins so commonly ascribed to cholera. The peritoneum rather moist than otherwise.

The mucous coat of the stomach, at the great end, presented a broad ecchymosed and punctated patch the size of the hand, and the same prevailed in smaller patches, at somewhat distant intervals, over it. Stomach flabby. Except the general tinge from the congested veins, the mucous coat of the small intestines did not present any thing very particular in its condition generally: many of the valvulæ conniventes of the jejunum presented red patches of six lines diameter, of infiltratred blood of a black colour. Peyer's glands not visible; Brunner's, especially in duodenum, the size of flaxseed, did not contain any thing like cholera fluid as asserted by some. Large intestines natural; glands visible, but with no peculiarity.

In this subject the fibrinous lining of the small intestines did not exist, possibly from that element of the blood having been impaired and reduced by his previous anasarca. Spleen of small size. Liver natural. Gall-bladder in middle state of distention, containing mucus tinged deeply yellow with bile. Urinary bladder contracted. Kidneys, when papillæ were squeezed, yielded the puruloid matter spoken of in cholera, but no urine.

The sclerotica was dried transparent in the fissure between the lids, so that the choroid shone through it. The exterior of the body did not present any thing very peculiar except the red and clammy state of the hands. The cellular substance, to my great surprise, had the cholera dryness notwithstanding its recent anasarcous condition. The beginning of the colon was injected minutely with size, and some portions of the small intestine, and dried. I found then upon the appendicula vermiformis, a few cholera vesicles attached to its mucous coat; the head of the colon did not exhibit them, but presented an abrasion, which possibly may have followed their evolution and removed them. This abrasion of the superficial venous layer was so complete that not a vestige of it was left except the small solitary trunks which project inwards to receive its blood like the petrous sinuses receive that of the cavernous by reducing it into longitudinal channels.

*October 2d.*—A patient, named Jonah Warren, aged sixty-nine, died in the white surgical ward, in the asphyxied state, which lasted for two days; but as his friends removed him we lost the chance of examination.

Case VII. *Asiatic Cholera—September 30th,* 1834—*Stages Accelerated—Death in Eight Hours and a half from the Inception or Incubation.*—Joseph Strahan, city commissioner, a short muscular man, æt. 50, had without previous indisposition, this forenoon at 11 o'clock, a large liquid stool, without pain; he became somewhat weak, and his head a little confused.

He dined at 1½ o'clock, P. M. eating lightly of roast pork, sweet potatoes and beets. About 2 o'clock he thought of going to the office to pay off some men; his wife, as he complained, wished him to stay at home, and send for a doctor. In a little time he felt chilly, and went to the bed room, where a fire was kindled. About 3¾ he was seized with a violent spasm, and I saw him at 4. His skin was then cold; his countenance cadaverous; a cold exhalation about the wrists and hands; no pulse; consciousness retained; excruciating spasms in both legs; sometimes more in one than another; vertiginous; in a few minutes he lost his vision, but it returned in half an hour. I opened the median basilic vein in the left arm, as it hang over the side of the bed, and got an interrupted small stream of black blood; by coaxing the arm, and keeping the bandage on for an hour, sixteen or eighteen ounces in all were got. At 4½ o'clock he had an universal convulsion, with stoppage of the breath, and an appearance of being in the act of dying, which lasted for a minute, he then became conscious. About 5½ the median cephalic vein of the right arm was opened, and by coaxing also, we got away about eight ounces more, which flowed in a cold stream, of the temperature of his hand. At from 4½ to 5 o'clock, ʒj of pulv. ipecac. was administered; this not vomiting in due time, a mixture of salt and mustard in warm water, a table-spoonful of the first to a tea-spoonful of the second was given: this also failing, ʒss. of ipecac. again was administered; this failing too, Dr. Stewart, the family physician, who had joined me at the moment of the first bleeding, passed the feathered end of a quill repeatedly down the œsophagus, which failed too; feeling at this period an inclination to stool, he got up, but in a state of extreme debility; no evacuation followed.

There being no chance of producing vomiting from what has been seen, spirits of camphor, and laudanum were administered every half hour; turpentine and camphor had been constantly rubbed upon his legs; a mustard plaster was now put on the pit of the stomach. About 5½ o'clock, a dozen cups put on epigastrium. At this time the pulse was perceptible at the wrists; and the face took a better colour. He complained, however, of excessive pain in the stomach, of a load on his breast, with difficulty of breathing. His breath was now cold, and the end of the tongue; the latter was also white, and exsangous. A perspiration stood upon his forehead; his hands and wrists still cold and clammy.

The symptoms went on till 7½ P. M. when he died. The family being opposed to it, the benefit of an examination was lost.

Case VII. *Stage of Maturity—Cured by Bleeding.*—Gardiner, æt. 50, in the Philadelphia Alms-house, for a chronic rheumatic affection of the neck, for which he was under treatment by a seton below the part. Was seized this forenoon, September 29th, 1834, about 9 o'clock, with vomiting and purging of serous matter; his pulse was enfeebled; his skin cold, and a face naturally florid, of a bluish tinge. Spasms in legs.

He was cupped over the abdomen; and had ice given him to hold in the mouth. At 12 o'clock I saw him, and directed the following formula:—Aq. camphorat. ℥v.; Sp. lavand. ℥ss.; Tinct. opii. ʒiss. M. Take a table-spoonful every hour till the diarrhœa and sickness are abated. Venesection, ℥viii. Stimulating frictions of Camph. Sp. turpent. and Oil of origanum, mixed; sinapisms on various regions. 5 o'clock in afternoon, state about the same; ordered him to be bled again at 8 o'clock, which was done, and about ℥iv. were obtained. Other treatment continued.

*September 30th, 11 o'clock.*—I find reäction fully established; a glow in skin; full elastic pulse, and strength returned. Vænesect. ℥viii. Camph. mixture discontinued.

31*st.* Patient well.

Case VIII. *Incubation Lasting for Two days—Great Abundance of Vesicular Eruption on Intestinal Canal—Loss of Epithelium of Stomach—Softening of its Mucous Membrane.*—Mrs. ——, æt. 37, of a delicate frame of body, who had been last spring much indisposed with dyspeptic symptoms and extreme debility, with a disposition to œdema of the legs, and whose general habit was that of costiveness, was seized in the morning of Wednesday, October 1st, with what she considered simple diarrhœa of a watery kind. The complaint continued that day, during the night, and also on the next day, when to it was superadded vomiting. I saw her on Thursday evening, at 8½ o'clock, and prescribed for her the camphorated mixture as above, every hour or two; directed sinapisms to feet and epigastrium. As none of the evacuated matter was at hand, I could not tell the character of it, but suspected cholera, as the pulse was small; the tongue flabby, white, and exsanguineous; skin rather cold, with some epigastric pain; prostration.

At my visit on Friday morning, 9½ o'clock, I found that she had vomited a thin watery fluid, and purged the whole night a matter consisting of serum, with a large proportion of albumen, somewhat tinged red or pink, with a small quantity of shreds of lymph in it.

As the fluid had been at rest, the serum was supernatant, and the other formed a thick deposit like gruel at the bottom; in other words, she had the true cholera discharge, and was in the matured stage. At an early hour in the morning, her husband had called upon me, to represent her condition, and I then prescribed a solution of bicarb. of potash, with gum Arabic in mint water and laudanum every hour. At my visit I found that this medicine had been rejected by vomiting; that the prostration had augmented; pain in epigastrium increased; restlessness; lethargic indifference to things around; great oppression in the breast; cramps of legs; pulse smaller and more rapid. I then prescribed extract opii, gr. ss. every hour, till three grains was taken; wine whey ad libitum; injection of tinct. opii, ʒj.; frictions of sp. turpentine. At 1 o'clock I found that the opium had stopped the purging and vomiting almost entirely; the case, however, had progressed in all its essential symptoms, and the cholera face, which had been rather doubtful before, was now fully expressed. As her common emaciated state had left but little red blood in her, the cyanose colour was absent, or at least doubtfully present.

As it is useless to trace symptoms further, it may serve merely to state that the asphyxiated state marched forward incessantly to its acmé, and in spite of our exertions, she died at 10½, P. M.

*Examination, assisted by Dr. Gerhard, October 4th,* 1834, *eighteen hours after death.*—Facies choleric; tetanic rigidness of all the muscles; abdomen pasty; fingers bent firmly, somewhat corrugated and blue at the ends.

The peritoneum was dry; stomach and bowels moderately distended; the small intestines presented the peculiar pink colour of cholera, with here and there a loop with the veins most minutely injected with black blood, so as to give a crimson colour.

The mucous coat of the stomach was slightly injected, spongy, and so soft, that it was easily scraped away with the nail and with the ring handles of the scissors. The mucous coat of the large intestines was in the same condition; that of the small intestines was much reduced likewise in consistence, besides presenting its veins finely injected. The muciparous glands were all enlarged, and the villi tumid.

The alimentary canal entirely free from fæces; contained the cholera fluid abundantly, and of a gruelly consistence, tinged somewhat yellow in the stomach and duodenum.

There was no indication of scirrhus or ulceration to mark her former gastro-duodenitis. The liver was in a flabby state, with its granuli reduced in size, the flaccidity of it resembled what might be represented by a liver half dried. The gall-bladder contained bile. Spleen small. Pancreas healthy.

Kidneys healthy, but contained in tubuli the puruloid matter of cholera. Bladder contracted. An ancient adhesion of fimbriated orifice of Fallopian tubes to ovaria, so as to occlude them; she had never borne children. Uterus small, but healthy; lining membrane of body red in patches; canal of neck glued up by a strong gelatinous effusion, which could be drawn out in shreds and traced into the orifices of the follicles; it was quite as tenacious as in pregnancy.

There had been, during her illness in the spring, a strong epigastric pulsation; we found the aorta sound, as well as other arteries, so that it must have come merely by the stroke of the aorta communicating its impulsion to the liver and stomach.

Having by frequent examinations become convinced that the seat of cholera is in the abdomen, I did not extend my observations to other cavities.

In this case I made a minute injection of the pyloric end of the stomach, of some sections of the jejunum, and of the beginning of the colon and adjoining part of the ileum. The injection penetrated both arteries and veins with an almost inconceivable minuteness. In regard to the veins, when the parts were dried they opened on the internal surface of the bowels and stomach, as if excoriation had left their orifices bare. Hundreds also of cholera vesicles were found on the mucous coat of the jejunum jutting out from its surface in a spherical form so distinct as to leave no doubt of their being neither tumefied villi, follicles nor glands; they were especially numerous along the bases of the valvulæ conniventes. The superficial venous layer of the colon was entirely detached, except in a few places, and there it seemed like the skin of a locust just ready to fall off, it being so loose that the injecting matter had not passed into it. It there presented the cribriform appearance, being actually perforated from side to side by the sloughing process. No vesicles were found in the colon, and probably for the reason that they had been removed by the sloughing of its cuticle and superficial venous layer; neither were vesicles found in the stomach, and probably for the same reason.

Case IX. *Alms-house, October 5th*, 1834.—Joseph Walker, a black man, aged fifty-four, suffering from hemiplegia, was seized with diarrhœa on the 2d instant, which he did not report till the next day, when the symptoms of Asiatic cholera appeared in the evacuation by the stomach and anus of large quantities of the cholera fluid; his disease progressed under the usual form into asphyxia, which was attempted to be resisted by large doses of a mixture of acetate of ammonia, extract of opium and camphor water, with stimulants to surface. He died on the 5th instant, about 1 o'clock, A. M.

On *examination*, in eleven hours afterwards, the state of all the abdominal viscera was so much the same with that in the preceding case that they seemed to be identical in pathological appearances. In addition, a large ulcer was formed at the pyloric end of his stomach; some small ulcers, seemingly of an anterior date and tuberculous character, existed in the small intestines, and a plate of lymph was found adhering to the upper part of the jejunum.*

Case X. *July 29th,* 1832—*Autopsy five and a half hours after Death—Present Dr. Hodge, the prescribing Physician, and several others.*—William Ellis, aged forty-seven, intemperate, a resident of the Philadelphia Alms-house, of muscular make, but subject to rheumatism, was seized on the 28th, at 9 o'clock, P. M. with sickness of stomach, purging, pain in the epigastrium, and other symptoms of Asiatic cholera. In the same ward, a few days before, another man had been attacked with this disease, and died from it. After the symptoms had continued for some time, he went into the state of collapse.

I saw him for the first time, and at the request of Dr. Hodge, at 9½ o'clock, A. M. on the 29th, the date of this paper. His state then was as follows:—skin universally cold to the feeling, and somewhat inelastic and flabby, cloudy and opaque; blood could be discovered in its veins, which, in fact, were filled with it, but not to extreme distention; the circulation of it was languid, but yet perceptible, for when a vein was emptied by friction it filled up again. There was no moisture on his skin though it had a damp clay-like feel. His tongue was cold but moist, and only slightly furred. His respiration was full and heavy. He was comatose, but only to such a degree that he could be roused and caused to answer a question pertinently, by slapping his face and calling him loudly by name. There was no pulse at the wrist, but it existed about the middle of the brachial artery, and beat from 160 to 170 in a minute almost imperceptibly. His breath was cold. The pupils were contracted, and the eye had a glassy cadaverous look. His muscles occasionally twitched, especially in the arms, but there was not an universal spasm.

At this time it was said that he had not purged or vomited for some hours. The treatment up to this period, from the beginning of the attack, consisted in an extensive vesication of the fore-arms;

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* Not being apprized at this time of the existence of the vesicular eruption of cholera, I did not observe the proper mode of detecting it.

stimulating frictions; twelve grains of opium and volatile julap, which seemed very disagreeable to his taste.

Dr. Hodge being desirous of trying the effects of the injection of a weak solution of muriate and carbonate of soda into the veins, I opened the median basilic vein, and with the assistance of Dr. Hopkinson threw in by small quantities at a time, about five pints of this solution, the whole operation occupying about one hour and a half. Dr. Jackson held the stethoscope to the heart, and found its action increased as well as the respiratory murmur of the lungs; the capillary circulation seemed also slightly quickened by it. These effects were very transient, and the patient died at 11½ o'clock.

*Autopsy, 5 o'clock P. M.*—Skin of very much the same hue as before death; muscular system in a state of rigid fixidity, the belly being swollen and immoveable.

*Head.*—Brain healthy, its veins being only moderately distended; it was watery, which may have been caused by the injection; consistence good; a drachm of serum in each lateral ventricle.

*Thorax.*—Viscera healthy; scarcely any blood in right side of heart, it may have run off by opening the brain previously; not much in left side; no coagula. Lungs, posterior part infiltrated, and engorged with blood, as common in dead bodies; they collapsed on opening thorax.

*Abdomen.*—Peritoneum healthy; a rosy tint on exterior surface of all the bowels and stomach. Liver of a light colour; spleen healthy; pancreas healthy; gall-bladder filled with bile.

The stomach contained a pint of a dark watery fluid, consisting principally of the drinks of the patient. The duodenum and jejunum were flaccid and filled with a fluid like cream in colour and consistence, but slightly odorous; the ileum and the colon were filled with a fluid much more watery than the last, as if a good deal of water had been added to it, or it resembled cream and water, or thin wheat flour gruel. There were no fæces in the intestines, no bile, and only here and there a small loose cake of mucus.

The mucous coat of the stomach and bowels was of a healthy consistence, and tinged of a pink red, as if there might have been a considerable vascular turgescence which had subsided on death, as in the eruptions of the skin. Their appearance, besides, was somewhat as if they had been dusted with flour or pearl powder, allowance being made for a moist surface. The muciparous glands, from one end to the other of the intestinal canal, enlarged, especially the glandulæ solitariæ. The bladder was contracted into a hard empty ball. The femoral, anterior tibial, humeral, radial, ulnar, and all the other arteries examined, were contracted to one-half their common diameter, with the internal coat in longitudinal wrinkles. The smaller arteries had their internal coat as if it had dried for an hour or so. The veins of the extremities were filled with fluid black blood, and bled freely on cutting for the arteries. The larger arteries contained some black venous looking blood, but the smaller none. The arterial system looked as if there had been no circulation, except in the larger trunks, for some time before death.

Case XI. *July 30th,* 1832—*Philadelphia Alms-house—Absence of Vomiting and Purging—Autopsy, fifteen hours after death.*—Manuel Works, an idiotic black inmate, aged forty, while walking in the yard, was seized suddenly with spasms in the legs; this was followed immediately by the state of asphyxia, manifested by cold inelastic skin; corrugated fingers; want of pulse, excepting in one arm, where it was merely perceptible; heavy, slow respiration; cold breath; spasmodic rigidity of muscular system; fixed eye, and sunken countenance. He retained for some time self-possession enough to strike at the assistants, who were officiating about him. Dr. Hodge being in attendance, the treatment he adopted, consisted in uninterrupted mercurial and stimulating frictions, and an injection strong with red pepper. At half after 3 o'clock, P. M. I saw him; the superficial veins were then turgid with blood; we opened two veins in the left arm, one in the right, and the two anterior temporal arteries. From these five orifices, all of which were very free, we obtained not more than four ounces of black blood, which coming out, guttatim quickly coagulated. The arteries bled only a few drops, and the veins seemed to have evacuated not much more than what was previously in them, when, with all our rubbing, only a few drops of blood at a time could be got out. The arterial blood was of the colour of common venous blood. At 7 o'clock of the same day the patient died. From the time this patient came under observation there was neither vomiting nor purging; but the abdominal muscles were tense as usual.

The next day at 10 o'clock, he was examined by Drs. Hodge, Hopkinson, myself and several others.

*Thorax.*—Lungs healthy. *Heart.* Coronary veins turgid. Right auricle and ventricle contained the usual quantity of blood; some of which was in white polypous concretions, the other partially coagulated, and no inconsiderable part of it in the state of serum coloured red, which poured freely out of an incision previously made into the aorta. The arteries of the legs were of their common calibre, and flattened, but contained some black blood. Veins generally filled with blood.

*Abdomen.*—Peritoneum dry. *Liver* sound. Alimentary canal of a pink colour, from the quantity of blood in the sub-serous vessels, and somewhat thicker than usual. The mucous coat of the stomach had a tinge not much inferior to that of red sealing wax, and the summits of its rugæ were black. A lighter tinge of red prevailed in the whole of the valvulæ conniventes and mucous coat of the small intestines, and they, with the stomach, were lined with a bloody, opaque, tenacious mucus. Mucous coat of colon not much altered. There was neither in the stomach nor bowels any of the cream-like or gruel-like fluid common to cholera. But we found in the stomach a handful of undigested aliment, consisting of masticated fragments of green gages, and large pieces of meat. Portions of these articles were found in intervals along the intestinal canal, and some of them had even got down into the transverse colon. The particles of the red pepper injection were found adhering to the mucous coat of the colon in its whole length.

The inferences from this case are, that the patient's attack was brought on by the indigestion of the articles found in the alimentary canal—that the canal was in a state of high irritation, which only wanted time to make it an inflammation pathologically, and produce the corresponding changes of texture—this being proved by the universal vascular turgescence of the mucous membrane of the stomach and bowels, and that the deficiency of the characteristic fluid arose from the attack being so rapid, that there was no time for the secretion of it to occur.

A report prevailed in the city after the death of this patient, that he died from eating a chicken's head; this is a mistake, for none was found in his stomach or bowels on this occasion, although from his want of intelligence, he was in the habit of eating the offal matter found on the grounds of the alms-house, and among many other articles, may from time to time have swallowed a chicken's head, or any other substance.

Case XII. *Vesicular Eruption on Stomach, Ileum, and Colon.*—Dennis Falkland, æt. 13, a driver on the canal, was admitted into the cholera ward of the Alms-house on the 16th of October, at 4, P. M. He stated that he was attacked about noon the day previous with purging and vomiting, both of which continued up to the time of his admission; cramps of the hands having supervened but a few hours previously.

On admission pulse very small, feeble and quick; extremities cold, with blue nails, and inelasticity of the skin; eyes sunken and haggard, with a livid circle around them; tongue white, moist and cold; thirst intense; no vomiting; bowels opened shortly after admission, stool thin, fœtid, and apparently purulent; respiration slow, breath cold; intellect obtuse, but when roused he conversed rationally; slight cramps of the hands; continual jactitation, and a great indifference to every thing around him, lying generally with his eyes closed, except when addressed in a very loud tone. Frictions with tr. capsicum were immediately resorted to, and grs. v. carb. ammon. were administered every half hour in a julap, with ice and cold drinks.

These produced little or no benefit, and between six and seven, he was placed in a bath of about 100°, (F.) strongly impregnated with salt, where he was allowed to remain half an hour, having at the same time cold applied to the head.

Shortly after being placed in the bath, of the warmth of which he complained very much, he vomited a quart of "rice water fluid," which was nearly inodorous. Frictions with capsicum were again resorted to, together with the application of a large sinapism over the abdomen, and bottles of hot water to the extremities. The sinapism commenced drawing very well, when the nurse, induced by his complaints, took it off. At this time, 8½ o'clock, I saw him first, opened a vein in each arm, and succeeded in drawing about ℥iv. of blood, which coagulated very soon. He was then enveloped in a blanket saturated with hot water; the whole abdomen was covered with a decoction of cantharides in spts. terebinth. Carbon. ammon. grs. v.—opii, gr. ss. in ℥j. of mucilage of Ulm. Amer. were ordered every half hour, and ℥ij. of blood to be drawn every two hours, if practicable.

At 11 o'clock ℥iss. were obtained with great difficulty, and at 1, but ℥j. could be drawn.

The patient continued to sink, and expired about 11, A. M. on the 17th.

*Autopsy, at 4½, P. M. in the presence of the house Physicians and Students in attendance.*—Universal rigour of muscular system, which came on sometime after death. Fifteen minutes immediately subsequent to that event he was still limber, though his eyes had at that time lost some of their fluids, for they yielded very readily to pressure.

*Abdomen.*—Peritoneum very dry. Liver natural. Gall-bladder filled with green bile. Spleen small. Urinary bladder contracted. Kidneys dry, but yielded in small quantity from the tubuli some puruloid fluid.

Small intestines had universally the pink colour of cholera, with here and there loops of a dark red colour from the accumulation of venous blood; contained a large quantity of muco-albuminous matter mixed with a small proportion of serum. The mucous membrane was softened, its veins congested, with here and there patches of ecchymosed blood, some a few lines, and others several inches in diameter.

The light being imperfect, we could not well determine the state of the muciparous glands.

Large intestines externally not so pink-coloured as the small, contracted somewhat. Mucous coat with patches of extravasated blood, and contained a very fœtid purulent serum, such as he had discharged by stool.

Stomach not examined at the time, as I retained it for a preparation.

The jejunum, at its upper part, had the albuminous matter tinged with green bile. Lungs sound, not more congested than usual after death. Cavities of heart occupied by very black blood, and coronary vessels much distended with same.

I injected minutely in this case the arteries and veins of the stomach, and of the beginning of the colon, and dried them. The stomach then presented internally, near its pyloric orifice, a cluster of cholera vesicles, about a dozen in number, piled up in a cone, and having a bed of coagulating lymph at the base. Great numbers of the same vesicles were found upon the mucous coat of the ileum and colon, most numerous generally where beds of coagulating lymph existed, but still found in abundance elsewhere, adhering to the septulæ of the follicles.

We propose to continue this subject in the next No. of this Journal, and to illustrate our observations with plates, representing the conditions of the mucous membrane in cholera and in health.

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## ART. IV. *Case of Inverted Uterus.* By BURLEIGH SMART, M. D. of Kennebeck, Maine.

FEBRUARY 28th, 1833, Mrs. S. L. æt. 31, was confined this day three weeks with her first child; having been very sick ever since confinement, and no improvement in her symptoms, I was desired to see her.

Her situation had been such, that the catheter was used twice daily; great distress in the vaginal and perineal region, with inability to be raised; she had reclined constantly on her back; great prostration and frequent partial faintings.

Dr. E. the attending physician and accoucheur, says that there is a tumour in the vagina, which he supposes to be an excrescence, or scirrhus or polypus connected with the fundus of the uterus, and which appeared there on removing the placenta, and has been there ever since He states that the labour was tedious, and the delivery, which was finished with the vectis, was difficult. The attendants say there was great exhaustion and considerable hæmorrhage. She now appears bloodless.